Docket No.: 0756-7263

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:	)
Shunpei YAMAZAKI et al.	)
Application No.: 10/799,626	) Examiner: Unknown
Filed: March 15, 2004	) Group Art Unit:
For: LASER IRRADIATION APPARATUS,	) Not Yet Assigned
LASER IRRADIATION METHOD, AND	)
METHOD FOR MANUFACTURING	)
A SEMICONDUCTOR DEVICE	)

VERIFICATION OF TRANSLATION

Commissioner for Patents
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Sir:

I, Hikaru Tsuji, C/O Semiconductor Energy Laboratory Co., Ltd. 398, Hase, Atsugi-shi, Kanagawa-ken 243-0036 Japan, herewith declare:

that I am well acquainted with both the Japanese and English Languages; and

that to the best of my knowledge and belief the followings is a true and correct translation of the US Patent Application No. 10/799,626 filed on March 15, 2004.

I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Date: this 26th day of July 2004

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Name: Hikaru Tsuji

[Document Title] Scope of Claims

[Claim 1]

A laser irradiation apparatus comprising:

a first laser oscillator generating a pulse oscillation of first laser light having a wavelength at which an absorption coefficient to a semiconductor film is 1×10^4 cm^{-1} or more;

means for controlling a shape and a position of a region irradiated by the first laser light;

a second laser oscillator generating a continuous wave oscillation of second laser light;

means for controlling a shape and a position of a region irradiated by the second laser light so as to overlap with the region irradiated by the first laser light; and

means for controlling positions of the region irradiated by the first laser light and the region irradiated by the second laser light relative to the semiconductor film,

wherein the region irradiated by the first laser light and the region irradiated by the second laser light are overlapped in such a way that the region irradiated by the first laser light falls within the region irradiated by the second laser light.

[Claim 2]

A laser irradiation apparatus comprising:

a first laser oscillator generating a pulse oscillation of first laser light having a wavelength not longer than that of visible light;

means for controlling a shape and a position of a region irradiated by the first laser light;

a second laser oscillator generating a continuous wave oscillation of second laser light;

means for controlling a shape and a position of a region irradiated by the second laser light so as to overlap with the region irradiated by the first laser light; and

means for controlling positions of the region irradiated by the first laser light and the region irradiated by the second laser light relative to the semiconductor film,

wherein the region irradiated by the first laser light and the region irradiated by the second laser light are overlapped in such a way that the region irradiated by the first laser light falls within the region irradiated by the second laser light.

[Claim 3]

A laser irradiation apparatus according to claim 1 or 2,

wherein the first laser light has a second harmonic.

[Claim 4]

A laser irradiation apparatus according to any one of claims 1 to 3,

wherein the second laser light has a fundamental wave.

[Claim 5]

A laser irradiation method comprising the step of:

irradiating first laser light generated in a pulse oscillation having a wavelength at which an absorption coefficient to a semiconductor film is 1×10^4 cm^{-1} or more and second laser light generated in a continuous wave oscillation to the semiconductor film,

wherein when the first laser light and the second laser light are irradiated, a region irradiated by the first laser light and a region irradiated by the second laser light are overlapped in such a way that the region irradiated by the first laser light falls within the region irradiated by the second laser light.

[Claim 6]

A laser irradiation method comprising the step of:

irradiating first laser light generated in a pulse oscillation having a wavelength not longer than that of visible light and second laser light generated in a continuous wave oscillation to a semiconductor film,

wherein when the first laser light and the second laser light are irradiated, a region irradiated by the first laser light and a region irradiated by the second laser light are overlapped in such a way that the region irradiated by the first laser light falls within the region irradiated by the second laser light.

[Claim 7]

A laser irradiation method comprising the step of:

irradiating first laser light generated in a pulse oscillation having a wavelength not longer than that of visible light and second laser light generated in a continuous wave oscillation to a semiconductor film,

wherein when the first laser light and the second laser light are irradiated, a region irradiated by the first laser light and a region irradiated by the second laser light are overlapped in such a way that the region irradiated by the first laser light falls within the region irradiated by the second laser light; and

wherein the semiconductor film melts in the region irradiated by the first laser

light.

[Claim 8]

A laser irradiation method comprising the step of:

irradiating first laser light generated in a pulse oscillation having a wavelength not longer than that of visible light and second laser light generated in a continuous wave oscillation to a semiconductor film,

wherein when the first laser light and the second laser light are irradiated, a region irradiated by the first laser light and a region irradiated by the second laser light are overlapped in such a way that the region irradiated by the first laser light falls within the region irradiated by the second laser light; and

wherein in the region irradiated by the first laser light, the semiconductor film melts partially by the first laser light and the semiconductor film melts completely by the second laser light.

[Claim 9]

A laser irradiation method according to any one of claims 5 to 8,

wherein the first laser light has a second harmonic.

[Claim 10]

A laser irradiation method according to any one of claims 5 to 9,

wherein the second laser light has a fundamental wave.

[Claim 11]

A method for manufacturing a semiconductor device comprising the step of:

crystallizing a semiconductor film formed over an insulating surface by irradiating first laser light generated in a pulse oscillation having a wavelength at which an absorption coefficient to the semiconductor film is 1×10^4 cm^{-1} or more and second laser light generated in a continuous wave oscillation,

wherein when the first laser light and the second laser light are irradiated, a region irradiated by the first laser light and a region irradiated by the second laser light are overlapped in such a way that the region irradiated by the first laser light falls within the region irradiated by the second laser light.

[Claim 12]

A method for manufacturing a semiconductor device comprising the step of:

crystallizing a semiconductor film formed over an insulating surface by irradiating first laser light generated in a pulse oscillation having a wavelength not longer than that of visible light and second laser light generated in a continuous wave oscillation,

wherein when the first laser light and the second laser light are irradiated, a region irradiated by the first laser light and a region irradiated by the second laser light are overlapped in such a way that the region irradiated by the first laser light falls within the region irradiated by the second laser light.

[Claim 13]

A method for manufacturing a semiconductor device comprising the step of:

crystallizing a semiconductor film formed over an insulating surface by irradiating first laser light generated in a pulse oscillation having a wavelength not longer than that of visible light and second laser light generated in a continuous wave oscillation,

wherein when the first laser light and the second laser light are irradiated, a region irradiated by the first laser light and a region irradiated by the second laser light are overlapped in such a way that the region irradiated by the first laser light falls within the region irradiated by the second laser light; and

wherein the semiconductor film melts in the region irradiated by the first laser light.

[Claim 14]

A method for manufacturing a semiconductor device comprising the step of:

crystallizing a semiconductor film formed over an insulating surface by irradiating first laser light generated in a pulse oscillation having a wavelength not longer than that of visible light and second laser light generated in a continuous wave oscillation,

wherein when the first laser light and the second laser light are irradiated, a region irradiated by the first laser light and a region irradiated by the second laser light are overlapped in such a way that the region irradiated by the first laser light falls within the region irradiated by the second laser light; and

wherein in the region irradiated by the first laser light, the semiconductor film melts partially by the first laser light and the semiconductor film melts completely by the second laser light.

[Claim 15]

A method for manufacturing a semiconductor device according to any one of claims 11 to 14,

wherein the first laser light has a second harmonic.

[Claim 16]

A method for manufacturing a semiconductor device according to any one of claims 11 to 15,

wherein the second laser light has a fundamental wave.

[Claim 17]

A method for manufacturing a semiconductor device according to any one of claims 11 to 16,

wherein the semiconductor film formed over the insulating surface is crystallized by a heating process using a catalyst metal.

[Claim 18]

A method for manufacturing a semiconductor device according to claim 17,

wherein the heating process is performed using a gas RTA.